Presentation to the IT Directional Meeting

Wednesday, February 17, 2010

Pioneer Room, State Capitol

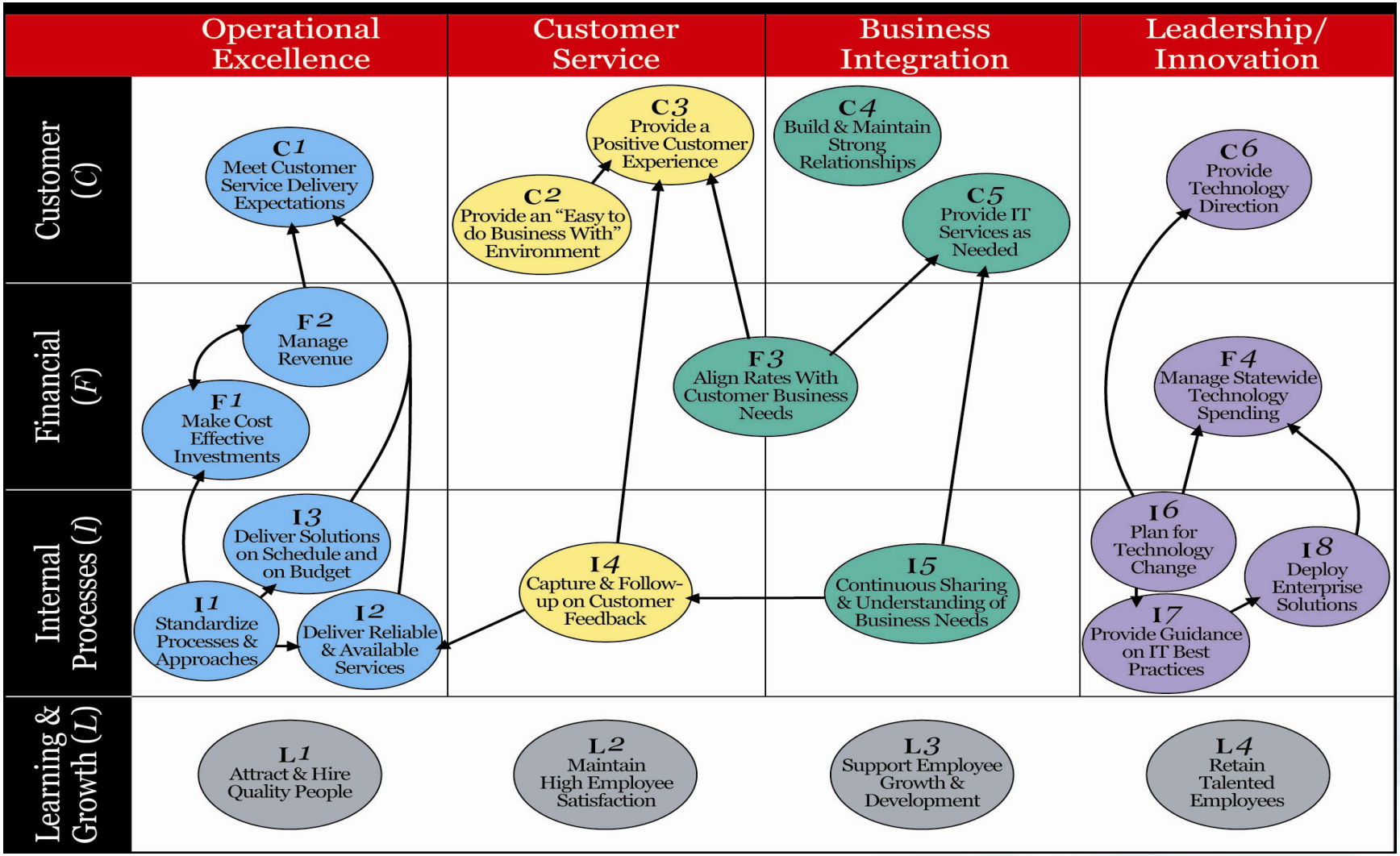
AGENDA

- Customer Account Rep's (Mike Ressler)
- Enterprise Services Update (Gary Vetter)
- Future Websphere Upgrade (Marlys Axtman)
- ADA Replacement Tool – Compliance Sheriff (Marlys Axtman)
- Long Distance / 800 Service / Calling Cards Update (Duane Schell)
- Windows 7 ITD Pilot Project Report (Dean Glatt)
- Server Virtualization Project Update (Dean Glatt)
- Security Update (Dan Sipes)
- State Network Upgrade Overview (Glen Rutherford)
- Cloud Computing / Software as a Service (SaaS) Overview (Jeff Carr)

Mike Ressler

Deputy CIO & Director of ITD

Strategy Map



Gary Vetter, Director

Enterprise Services Division

EDMS

- **TeleForm Upgrade** likely during the next three months
- **Imaging RFI** is being drafted with customer input
- **FileNet 4.5 Upgrade** is pending as an RFP for professional services is drafted
- **PeopleSoft-to-FileNet Connector** will be procured

ConnectND

- **Enterprise Learning Management (ELM) Deployed** on February 5th
- **Human Capital Management (HCM)** upgrade expected this summer
- **Candidate Gateway** and **Talent Management** will be evaluated after HCM upgrade

IT Procurement

- **WSCA Customer Satisfaction Surveys** may be forthcoming from PC vendors

IT Planning

Date in 2010	Planning Activity
March 2 through 4	**IT Plan Briefings**
August 15	**IT Plans Due**
September 1	**Large Project Information Submitted to SITAC**
September 20 and 21	**Large Projects Prioritized by SITAC**
November 1	**State IT Plan Released to Printer**
December 6	**State IT Plan Submitted to Legislature**

- Some exemptions to IT Planning Process are now allowed

IT Service Management

- **Service Level Agreements** are being drafted for enterprise services

Marlys Axtman, Director

Software Development Division

WebSphere

- WebSphere V7 has been available since Sept. 2008.
- We are in the preliminary stages of planning for an upgrade, we are hoping to complete the project within a 3 to 4 month window.
- Once we have had the opportunity to complete initial testing we will be working with the agencies to determine the dates for the upgrades to their systems.
- Expect a letter with the details including estimated costs.

.Net

- We are still running a few .Net applications that need to be upgraded from version 2.0 to version 3.5.
- We are in the process of identifying those applications and creating letters to be sent to the agencies asking for requests to complete the upgrades. Letters will be sent out by the end of the month.
- We anticipate completing the project by May 1st.

Compliance Sheriff

- This is the replacement tool for ADA checking, with added features.
- ITD staff has been using it, and creating documentation to help agencies get started
  - Guidelines for requesting the service
  - FAQ
- We are piloting with DOT and the City of Fargo.
- We will be sending this information to all state agencies by the end of the month.

Duane Schell, Director

Telecommunications Division

800 Service - Calling Card

- Long Distance Complete
- 800 Service
  - Cutover in progress
- Calling Cards
  - Re-issue of cards
  - Order by Friday Feb 19, 2010
    - Rose Wickham
    - rwickham@nd.gov
  - Project complete by mid March

L. Dean Glatt, Director

Computer Systems Division

SERVER VIRTUALIZATION

Powerful Benefits of Virtualization

- Cloud Computing
  - More details follow in Jeff Carr's presentation
- Systems are more highly available
  - Improved redundancy rates
    - Less time required to bring up systems following service interruptions
- Less physical space required
  - Excellent option to maximize physical space in data centers
    - For example:
      - Migrating 220 servers to 16 physical servers
      - 9 server racks to one
- Environmentally friendly
  - Lower power consumption
    - Decrease in cooling and power costs

SERVER VIRTUALIZATION

Challenges of Virtualization

- Environment Complexity
- New Toolsets
- Downtimes impact a greater number of applications

SERVER VIRTUALIZATION

Schedule

- February 22 – July 5, 2010
- Affects all agencies
- 10 servers/week
- Downtimes slated between 4 a.m. and 6 a.m.

SERVER VIRTUALIZATION

Communication

- Agencies notified prior to migration of their applications
- Minimal interruption of services
- Testing effort
- Contact Service Desk to report incidents

INTERNAL WINDOWS 7 PILOT

The Project

- ITD is rolling out Windows 7 as part of our PC Replacement Cycle
- Based on the 64-bit Windows 7 Enterprise Edition
- Span of project – 10 weeks
  - October through December 2009
- Internal team
  - Involved some 30 ITD employees from varying service areas
- Wide range of applications tested
  - Included standard office applications to custom applications
- ITD distributed a report to share our outcomes to help guide agencies through their own deployment of Windows 7

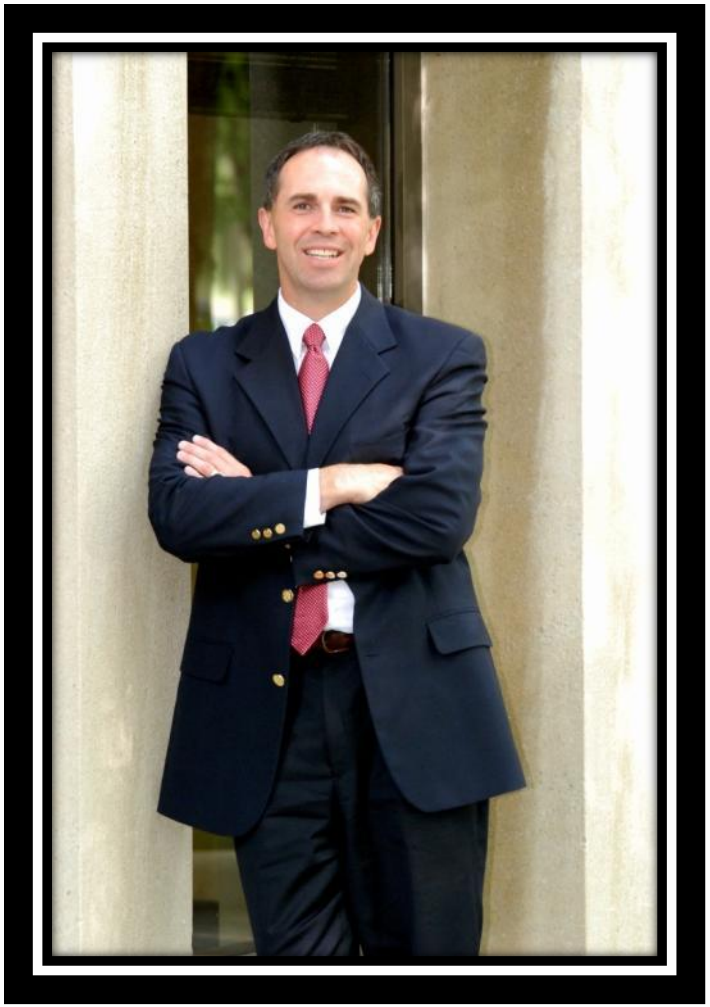
INTERNAL WINDOWS 7 PILOT

The Results

- Identified successes, problems, and resolutions
  - Great operating system
  - Most software applications tested work right out-of-the box
  - Developers and systems administrators identified some problems with custom applications
    - Working with vendors to resolve

Request Your Copy

- Contact the Service Desk to obtain a copy of ITD's findings
  - Great resource to guide your agency's deployment of Windows 7



Dan Sipes, Director

Administrative Services Division

SECURITY AND DR UPDATES

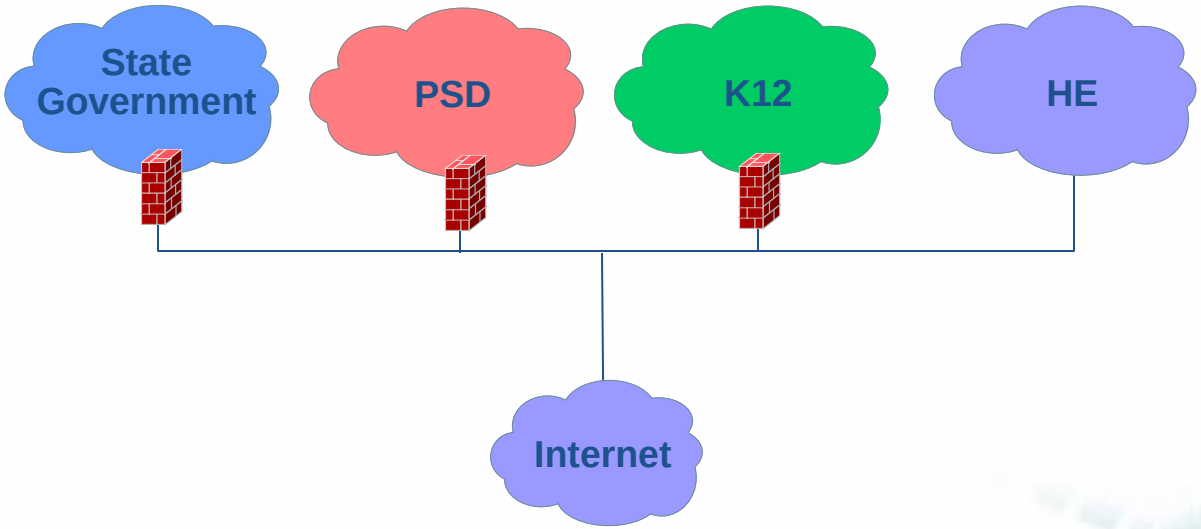
EMERGENCY NOTIFICATION PROCESS

- ITD Service Desk is the initial point of contact - 701-328-4470
  - Ensures that the incident is properly escalated within ITD and provides a 24/7 notification capability.
  - Please state that the incident is a Disaster Notification.
  - ITD Service Desk will log the incident and an ITD Incident Manager will be designated and will contact the original caller and obtain more detailed information.
  - Depending on the severity of the incident, it may be handled through normal processes or may be escalated for additional monitoring and follow up.
  - ITD Incident Manager will coordinate across ITD divisions and may contact the agency director or IT coordinator for further information.

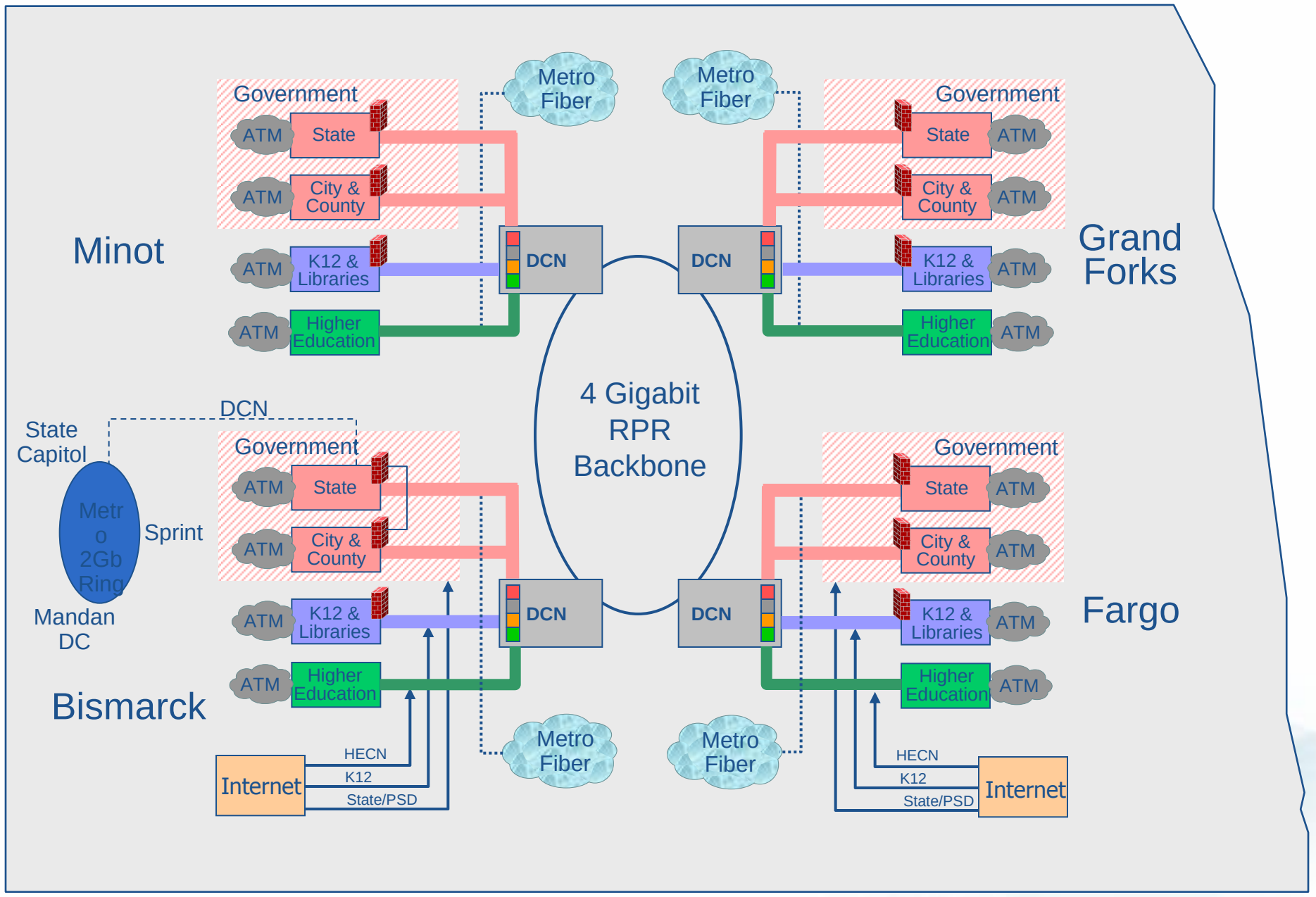
Glen Rutherford

Telecommunications Division

STAGENET
Current Configuration

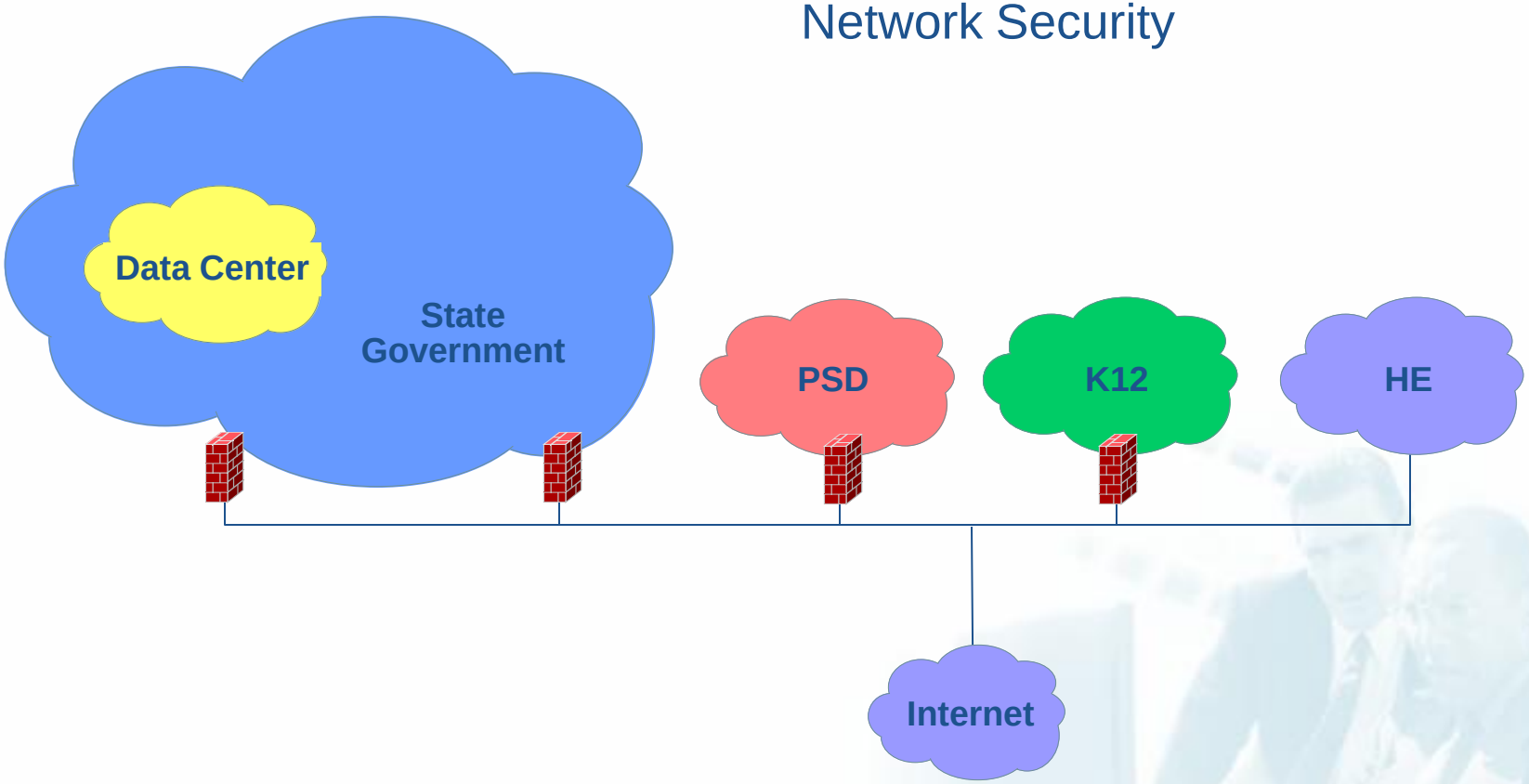


4 Logical Network Segments

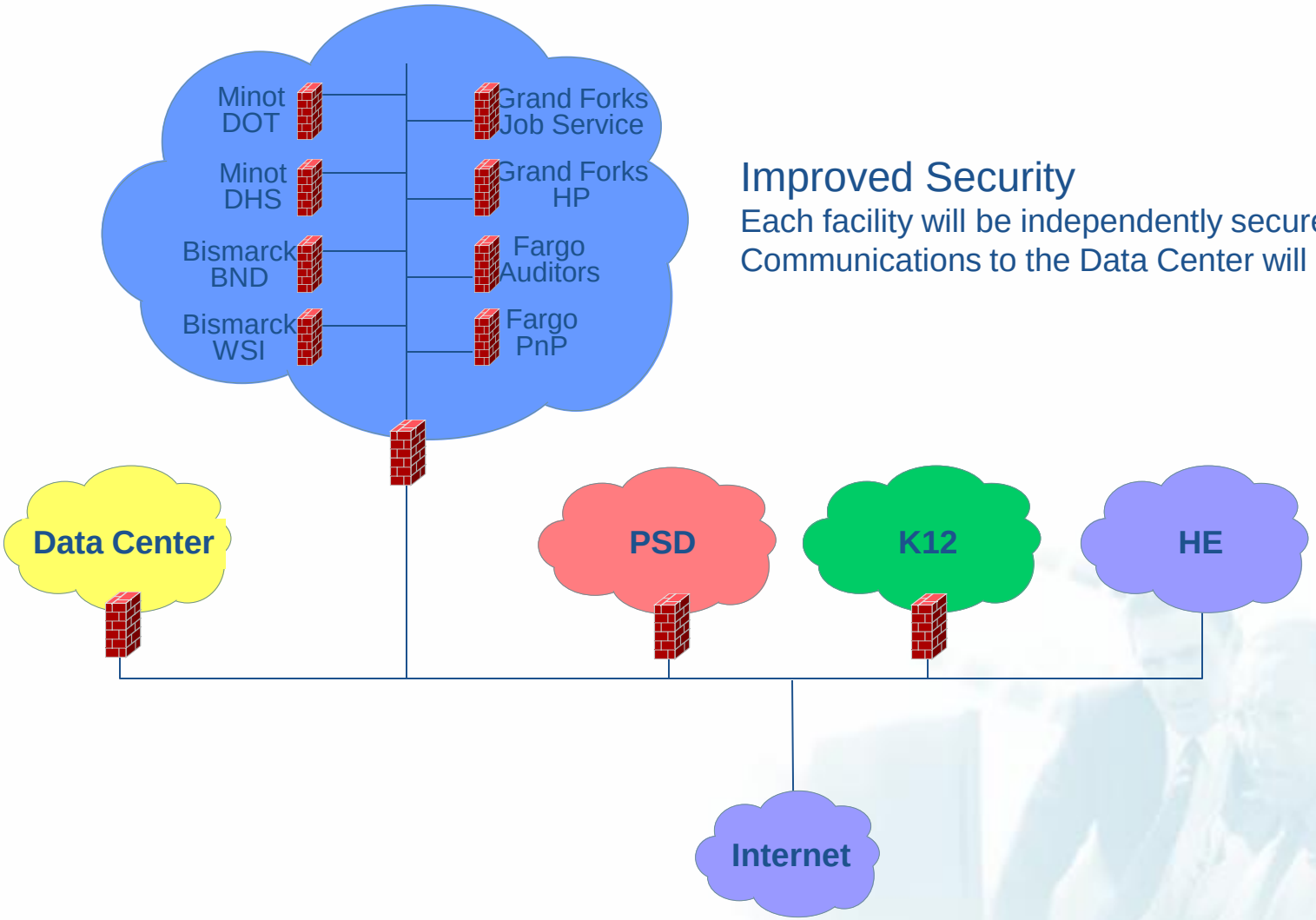

Minot
Government
ATM
State
ATM
City & County
ATM
K12 & Libraries
ATM
Higher Education
Metro Fiber
DCN
Grand Forks
Government
State
ATM
City & County
ATM
K12 & Libraries
ATM
Higher Education
4 Gigabit RPR Backbone
DCN
State Capitol
Metro 2Gb Ring
Sprint
Mandan DC
Bismarck
Fargo
Internet
HECN
K12
State/PSD

STAGENET
State Government

Network Security



STAGENET
State Government



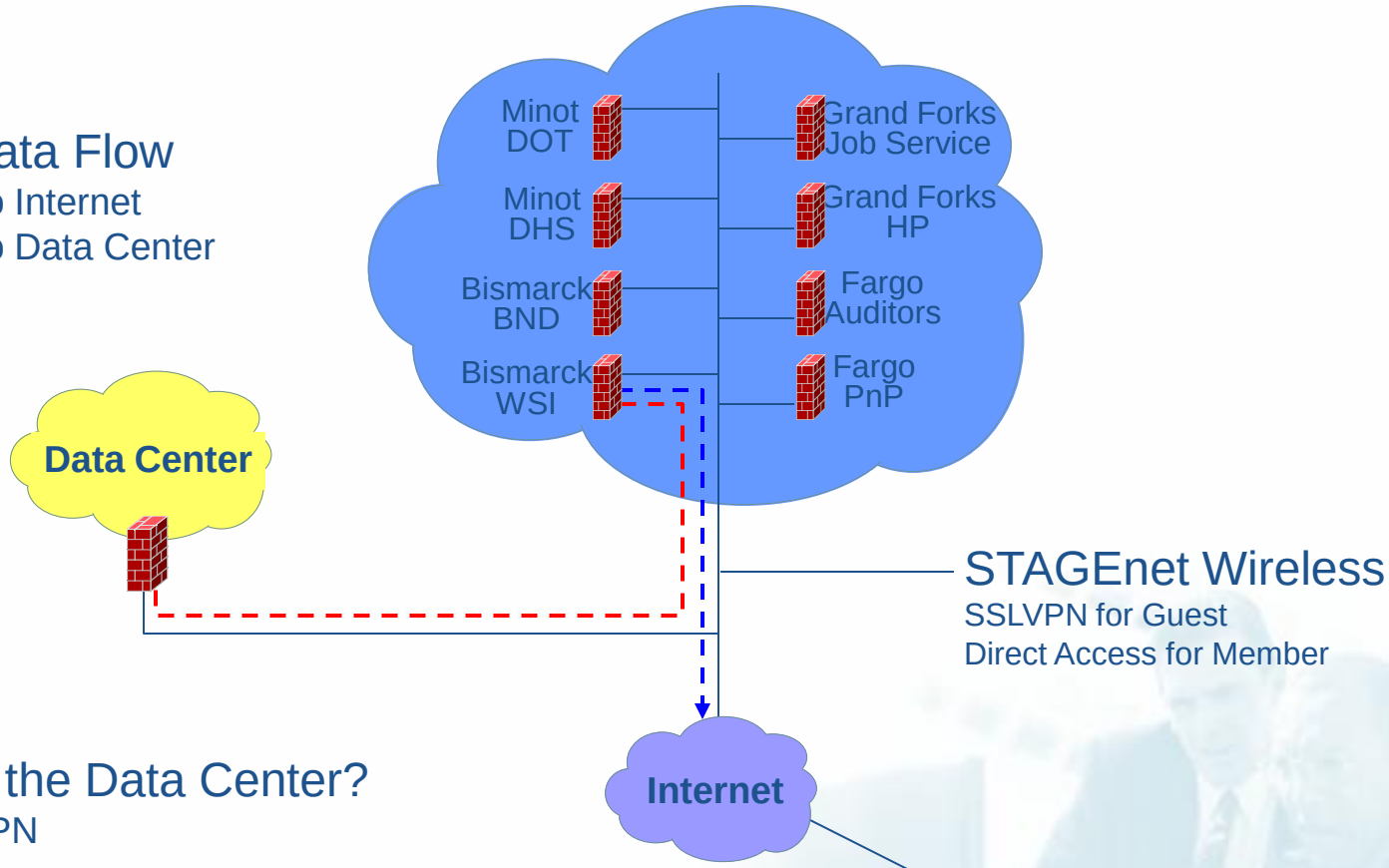
Improved Security

Each facility will be independently secured

Communications to the Data Center will be encrypted

STAGENET
State Government

Typical Data Flow
- Endpoint to Internet
- Endpoint to Data Center



STAGEnet Wireless
SSLVPN for Guest
Direct Access for Member

Access to the Data Center?
Net to Net VPN
SSLVPN
STAGEnet Wireless Member

Mobile Users
SSLVPN

Software as a Service (SaaS), Cloud Computing, Virtualization and ITD

Jeff Carr

Computer Systems Division

SaaS and Cloud Computing

- The buzz around SaaS and Cloud Computing is almost inescapable.
- The US Federal Government has launched a major Cloud initiative.
  - Many of the Federal “Cloud” offerings are actually SaaS.
  - SaaS and Cloud Computing are different things
- Amazon is building a new line of business: Cloud Computing focused on Government – Federal, State and Local.

What is SaaS?

- SaaS is a variation on traditional out-sourcing.
  - An application is hosted offsite by the SaaS provider and is typically accessed through a web browser.
  - All application specific data is housed offsite by the SaaS provider.
  - The application is a service => minimal, if any, customization.
- Examples: Yahoo Mail, Google Apps.

Benefits of SaaS

- Any computer with a browser can use the application => Reduce IT staff costs.
- In some cases, application costs are less.
  - Google Apps includes email, calendaring, an office suite, and collaboration tools for $50 per user per year.
  - Per user per month (or year) charge is the typical SaaS business model.
- The application can be accessed from anywhere via the internet.

Downsides of SaaS

- The application is accessible anywhere via the internet; if your “anywhere” lacks internet access……
- In many cases the web-based SaaS applications lack advanced functionality provided by traditional rich client apps.
- All data is housed at the SaaS datacenter.
  - Can present backup, integration, ownership challenges. We will return to this topic.
- No, or limited, application customization.

What is Cloud Computing?

- A 3rd party (Amazon, Rackspace, others) provides compute, storage, and network resources.
  - The cloud provider configures the size of the compute and storage resources based on customer request.
- The customer either:
  - loads a canned OS image/Web infrastructure/DB created by the Cloud Provider, or
  - loads the OS/Web/DB or other software of his/her choice.
- Customer loads/configures the application.
- Customer is responsible for OS/application patching/maintenance.

Cloud Business Model

- Bill for EVERYTHING!
  - Local network bandwidth; internet bandwidth
  - Disk Storage; IOPS (IO's per second)
  - Number of CPU Resources; Amount of Memory; hours that servers are available
  - Persistent Disk Storage and Disk Images

Server Description	Amazon charge – per month
SQL Server Standard, 4 physical CPU Cores, 8GB RAM, 2 TB Disk	$3393.20
Dual Core CPU, 8 GB RAM,100 GB Disk	$516.00

SaaS compared to Cloud

Task or Service	SaaS	Cloud	ITD Hosted
Physical Data Center	SaaS Provider	Cloud Provider	ITD
Physical Server Procurement	SaaS Provider	Cloud Provider	ITD
Server Configuration	SaaS Provider	Cloud Provider based on customer request	ITD
OS/DB installation	SaaS Provider	Customer (may be a canned image)	ITD
Application Installation	SaaS Provider	Customer	ITD
Ongoing Administration	SaaS Provider	Customer	ITD
Backup	SaaS Provider	Customer	ITD

Saas, the Cloud and “Your” Data

- SaaS and Cloud data ownership is unclear.
  - The SaaS/Cloud provider can be subpoenaed without notification to the customer.
  - Facebook recently attempted to copyright all data uploaded by its users.
- Data integration with other applications can be problematic.
  - This may require creating/maintaining a local copy of the data => additional charges.

Data concerns (cont'd).

- Cloud data backups may be the responsibility of the customer (eg. Amazon EC2).
- If the SaaS/Cloud provider does provide backup services, customer may wish a local backup in addition.
  - Private companies go out of business.

Cloud/SaaS Provisioning

- Cloud/SaaS providers depend upon rapid provisioning to meet customer requests for both expansion and contraction of service.
- This rapid provisioning is accomplished through virtualization.
  - Renting Cloud servers or SaaS services does not mean renting a physical server
  - Cloud/SaaS providers have pools of compute resources that are carved into individual chunks through virtualization.

What is Server Virtualization?

- A single physical server can provide many virtual servers.

Application
Operating System
Hardware

Traditional Server

Application 1	Application 2	Application 3
Operating System 1	Operating System 2	Operating System 3
Hypervisor		
Hardware		

Virtual Servers

Why Virtualize?

- Cost reductions:
  - Acquisition cost reduction
  - Power usage reduction, as much as 90%
  - Cooling reduction
  - Data center space reduction

Solution	# Servers	Power (watts)	Rack Space (U)
ITD Current	301	99,968	428
Minimum # Blades	21	9,912	20

Why Virtualize - II

- Management benefits may outweigh cost benefits
  - Rapid provisioning
  - Failover/High Availability
    - Equivalent to an Active/Passive cluster without pre-allocating hardware
  - Backup and Disaster Recovery
    - For Windows, integrates File Recovery with Disaster Recovery
    - Removes Windows/Linux HAL issues

Why Virtualize - III

- Intel/AMD are giving us little choice.
  - Industry average Intel CPU usage is 2-4%; ITD averages 5-7%.
  - Intel/AMD continually increase CPU performance, while discontinuing slower models.
  - Virtualization permits the use of the newer CPUs while elevating CPU usage to the 40-60% range.

ITD and Virtualization

- ITD manages over 200 Virtual Servers today.
- Over the next 5 months ITD will be virtualizing another 220 servers.
- By mid-to-late 2011, over 90% of the ITD managed Intel servers will be virtualized.

ITD, SaaS and Cloud Computing,

- ITD has, and will be, utilizing this virtual server environment to provide both SaaS and Cloud services.
- ITD is a SaaS provider for K12 – PowerSchool.
- ITD is a SaaS provider for State Government and Higher Ed – ConnectND.
- ITD is a Cloud Provider for State Government – DHS MMIS project, LR LEGEND project.

Conclusions - I

- **Third party SaaS providers can provide non-customized applications at lower cost (eg. Google Apps).**
  - Think about functionality – web apps typically lack features provided by rich client apps.
  - Think about “your” data.
    - Who controls it? Who backs it up? Is a local copy needed for integration with other apps.
- **Third party Cloud providers rent bare servers and it is a customer responsibility to load/maintain application and OS.**

Conclusions - II

- ITD provides SaaS to its customers today.
  - Data concerns present with third party providers do not exist
    - Data is local, backed up, and agency owned.
- ITD provides cloud services to some IT projects today.
- ITD is building a cloud for State Government use.

Questions?

Thank You